USDA Natural Resources Conservation Service

Ecological site F003XY709OR
Pseudotsuga menziesii/Vaccinium membranaceum/Chimaphila umbellata

Accessed: 06/30/2024

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

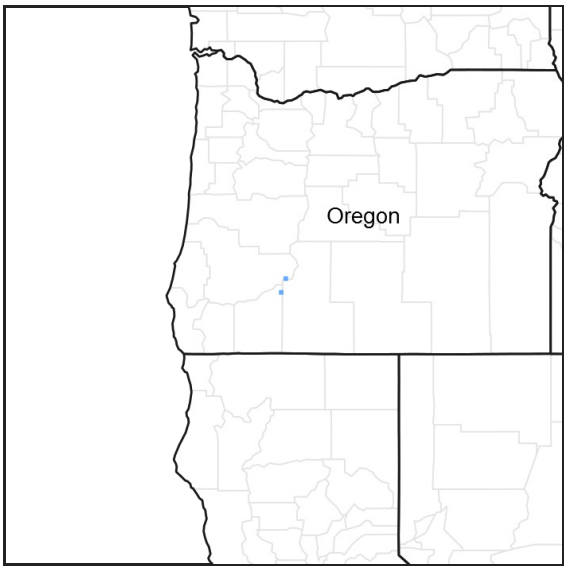


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Table 1. Dominant plant species

Tree	(1) *Pseudotsuga menziesii*
Shrub	(1) *Vaccinium membranaceum*
Herbaceous	(1) *Chimaphila umbellata*

Physiographic features

This site is found on moderately deep, moderately well drained, gently sloping soils on glacial moraine deposits on glacial valley sidewalls

Table 2. Representative physiographic features

Landforms	(1) Moraine
Flooding frequency	None
Ponding frequency	None
Elevation	4,500–5,500 ft
Slope	10–60%
Water table depth	60 in

Aspect	Aspect is not a significant factor

Climatic features

Precipitation is received mostly in the fall, winter and spring. Summer thunderstorms do occur and can provide small to large amounts of rainfall in a short period of time. Winters are cool and moist , and summers are hot and dry.

Table 3. Representative climatic features

Frost-free period (average)	120 days
Freeze-free period (average)	160 days
Precipitation total (average)	66 in

Influencing water features

NONE

Soil features

This site is found on soils developed in glacial moraine deposits on glacial valley sidewalls.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderate to moderately rapid
Soil depth	20–40 in
Surface fragment cover <=3"	0–15%
Surface fragment cover >3"	0–10%
Available water capacity (0-40in)	9.75–14.75 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	5.6–6.5
Subsurface fragment volume <=3" (Depth not specified)	15–40%
Subsurface fragment volume >3" (Depth not specified)	20–40%

Ecological dynamics

Douglas-fir is the dominant specie in the overstory of the historic climax plant community. This site is at the upper end of Doulas-fir occurrence. It is here at a higher elevation than other Douglas-fir sites due to the warmer west facing slopes. The warmer conditions allows the fir to grow at a higher elevation. Shasta red fir and White fir can be found in the overstory.

Fire is the major distubance factor in this site. The historic fire return interval, for lower elevations in the general area, has been reported to be 5 to 25 years. It is possibly much longer on this site due to its higher elevation and higher precipitation. Fire return intervals could be 70 to 200 years or more (similiar to Douglas-fir sites in MLRA 2).

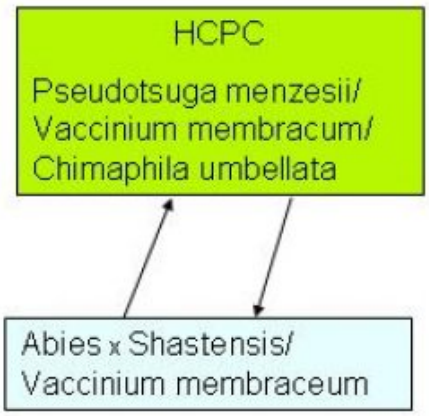
Douglas-fir is more fire resistant than associated trees on this site. It can survive moderately intense fires, where Shasta red fir and White fir can not. With the longer fire return intervals, fires were probably moderately intense, due to higher fuel loads.

Fire exclusion favors the establishment of Shasta red fir. It is more shade tolerant than Douglas-fir and will regenerate under a canopy cover. Overtime Shasta red fir will become the dominant tree in the overstory, but old growth Douglas-fir will remain. White fir can also be found, but the site is at the upper limits of white firs cold hardiness, so it is of limited extent. Mountain hemlock may be found moving in from higher elevations.

With fire suppression/exclusion fuel will build up on the forest floor. With this build up a stand replacing fire is inevitable.

A stand replacement fire can lead to either brush fields or new stands of Douglas-fir. This all depends upon availability of a seed source. Where seed trees are scare, it may take 100+ years for Douglas-fir to re-establish. Where some mature trees survived, seed may be available for regeneration. Douglas-fir seed are wind-dispersed so re-establishment depends upon seed tree location and prevailing winds.

State and transition model



State 1

Douglas-fir Plant Community

Community 1.1
Douglas-fir Plant Community

The Douglas-fir plant community is the historic climax plant community. It has been maintained by fire.

Forest overstory. The typical forest overstory composition of the Douglas-fir community.

Forest understory. The typical annual production of the understory species to a height of 4.5 feet (excluding boles of trees) under low, high, and representative canopy covers.

The percentages expressed are pecent canopy cover. Those species with "0" percent have a canopy cover of less than 1 percent.

Table 5. Ground cover

Tree foliar cover	50-60%
Shrub/vine/liana foliar cover	3-5%
Grass/grasslike foliar cover	0%
Forb foliar cover	0-2%
Non-vascular plants	0-1%
Biological crusts	0%
Litter	15-20%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0-1%

Table 6. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0%
Grass/grasslike basal cover	0%
Forb basal cover	0-1%
Non-vascular plants	0-1%
Biological crusts	0%
Litter	85-95%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0-1%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	0-1%	–	3-8%
>0.5 <= 1	0-1%	1-2%	–	–
>1 <= 2	0-1%	1-3%	–	–
>2 <= 4.5	0-1%	5-8%	–	–
>4.5 <= 13	1-2%	–	–	–
>13 <= 40	7-10%	–	–	–
>40 <= 80	40-50%	–	–	–
>80 <= 120	5-10%	–	–	–
>120	–	–	–	–

State 2
Shasta red fir

Community 2.1
Shasta red fir

The Shasta red fir plant community occurs due to fire exclusion. Shasta red fir dominates the overstory, but large old-growth Douglas-fir are present. White fir is also present.

Forest overstory. The typical forest overstory of the Shasta red fir plant community.

Forest understory. The typical annual production of the understory species to a height of 4.5 feet (excluding boles of trees) under low, high, and representative canopy covers.

The percentages expressed are pecent canopy cover. Those species with "0" percent have a canopy cover of less than 1 percent.

Table 8. Ground cover

Tree foliar cover	50-60%
Shrub/vine/liana foliar cover	10-15%
Grass/grasslike foliar cover	0%
Forb foliar cover	2-4%
Non-vascular plants	0-1%
Biological crusts	0%
Litter	10-20%
Surface fragments >0.25" and <=3"	0-1%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	1-3%

Table 9. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0-1%
Grass/grasslike basal cover	0%

Forb basal cover	0-2%
Non-vascular plants	0-2%
Biological crusts	0%
Litter	95-100%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Table 10. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	0-1%	–	1-3%
>0.5 <= 1	–	0-1%	–	–
>1 <= 2	–	3-5%	–	–
>2 <= 4.5	1-3%	15-20%	–	–
>4.5 <= 13	15-20%	–	–	–
>13 <= 40	5-10%	–	–	–
>40 <= 80	20-25%	–	–	–
>80 <= 120	15-20%	–	–	–
>120	–	–	–	–

Additional community tables

Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or**

decadence):

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

17. **Perennial plant reproductive capability:**